

Between Mice and Men, a New Type of Stem Cell

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Humans and other non-human primates stand out from their fellow mammals in many ways, but notably by having one particularly oversized area of the brain. This area, the outer subventricular zone (OSVZ) feeds migrating neurons to the neocortex the seat of sensory perception, spatial reasoning, conscious thought and language. Scientists always assumed the OSVZ must have its own source of stem cells if, in the developing brain, it is supplying neurons for such a broadly vital area of the human brain. They have now found them.

Arnold Kriegstein's team at UCSF used discarded fetal tissue to monitor cellular activity at various stages of development using a new labeling and tracking technique. They found the OSVZ to be a hub of cell proliferation. The newly found stem cell type goes through asymmetrical division producing a copy of itself and a daughter cell that is further along the path to becoming a neuron. That cell then goes through many rounds of symmetrical division producing many copies that can all then go on to become the desired neuronal cells needed in the neocortex.

A press release issued by UCSF on May 24 noted that the understanding provided by this model could shed light on many developmental brain diseases such as autism and schizophrenia. Kriegstein is quoted saying this understanding is critical:

“If we're going to understand how these disorders develop, we have to better understand how the human and primate cerebral cortex develops.”

Understanding this developmental pathway will also inform efforts to direct neural stem cells to become the replacement cells of choice for various therapies.

D.G.

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